AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) ~~Process~~ A process for the preparation of zinc alkyl chain growth products via a catalysed chain growth reaction of an alpha-olefin on a zinc alkyl compound, comprising contacting **[[the]]** an alpha-olefin and a zinc alkyl compound with a chain growth catalyst system which employs a group 3-10 transition metal complex, or a group 3 main group metal complex, or a lanthanide or actinide complex, and optionally ~~a suitable~~ an activator to form a zinc alkyl chain growth product.

2. (Currently amended) ~~Process~~ A process for the preparation of alpha-olefins, comprising ~~performing the process of claim 1~~ contacting an alpha-olefin and a zinc alkyl compound with a chain growth catalyst system which employs a group 3-10 transition metal complex, or a group 3 main group metal complex, or a lanthanide or actinide complex, and optionally an activator to form a zinc alkyl chain growth product, followed by olefin displacement of the grown alkyls as alpha-olefins from the zinc alkyl chain growth product.

3. (Currently amended) ~~Process~~ A process for the preparation of primary alcohols, comprising ~~performing the process of claim 2~~ contacting an alpha-olefin and a zinc alkyl compound with a chain growth catalyst system which employs a group 3-10 transition metal complex or a group 3 main group metal complex, or a lanthanide or actinide complex, and optionally an activator to form a zinc alkyl chain growth product, followed by oxidation of the ~~resulting~~ zinc alkyl chain growth product to form alkoxide compounds, followed by hydrolysis of the alkoxides compounds to produce primary alcohols.

4. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the zinc alkyl compound ~~comprises~~ is a species or mixture of species containing a R'R"CH-Zn or R'R"C-Zn moiety, **[[where]]** wherein R' and R" are independently selected from the group consisting of hydrogen, hydrocarbyl, silyl, and substituted hydrocarbyl, and may be linked to form a cyclic species, subject to the proviso that in the case of R'R"C-Zn, the C bonded to the Zn is unsaturated.

5. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the zinc alkyl compound has the formula $R_mZnH_{n_1}$ where m is 1 or 2 and n is 0 or 1, m+n=2, and each R is independently C_1 to C_{30} alkyl.

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6. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the zinc alkyl compound is selected from the group consisting of dimethylzinc, diethylzinc, di-n-butylzinc, di-n-hexylzinc, dibenzylzinc, di-n-decylzinc, di-n-dodecylzinc, di-phenyl-Zn and $(C_5H_5)ZnEt$.

7. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the alpha-olefin is selected from C_2 to C_{16} linear alpha-olefins.

8. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the chain growth catalyst system comprises a metallocene catalyst, which ~~may contain~~ contains at least one cyclopentadienyl-based ring ligand.

9. (Currently amended) ~~Process according to~~ The process of claim 8, wherein the **[[chain]]** metallocene catalyst ~~component~~ is represented by the general formula $(C_p)_m MR_nR'_p$ wherein at least one C_p is selected from an unsubstituted or substituted cyclopentadienyl ring, ~~a substituted or unsubstituted ring system such as~~ an indenyl moiety, a benzindenyl moiety, a fluorenyl moiety, and any other ligand capable

of η-5 bonding; M is selected from a Group 4, 5 or 6 transition metal, a lanthanide or an actinide; R and R' are independently selected from the group consisting of halogen, a hydrocarbyl group, and a hydrocarboxyl group having 1-20 carbon atoms or combinations thereof; and m=1-3, n=0-3, p=0-3, and the sum of m+n+p equals the oxidation state of M.

10. (Currently amended) ~~Process according to~~ The process of claim 8, wherein the **[[chain]]** metallocene catalyst ~~component~~ is selected from the formulas:

$(C_5R'_m)_p\ R''_s\ (C_5R'_m)\ M^*\ Q_{3-p-x}$, and

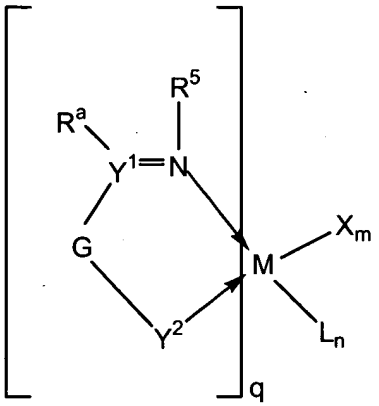
$R''_s\ (C_5R'_m)_2\ M^*\ Q'$

wherein M* is a Group 4, 5 or 6 transition metal, a lanthanide or an actinide; at least one $C_5R'_m$ is a substituted cyclopentadienyl; each R', which can be the same or different is hydrogen, or an alkyl, alkenyl, aryl, alkylaryl or arylalkyl radical having ~~from 1~~ up to 20 carbon atoms or two carbon atoms joined together to form a part of a substituted or unsubstituted ring or rings having 4 to 20 carbon atoms; R" is at least one C-, Ge-, Si-, P- or N-containing radical either bridging two ($C_5R'_m$) rings or bridging one ($C_5R'_m$) ring and M*; each Q, which can be the same or different, is selected from the group consisting of an aryl, alkyl, alkenyl, alkylaryl, or arylalkyl radical having ~~from 1~~ up to 20 carbon atoms, halogen, or alkoxides; Q' is an alkylidene radical having ~~from 1-20~~ up to 20 carbon atoms; s is 0 or 1 and when s is 0, m is 5 and p is 0, 1 or 2, and when s is 1, m is 4 and p is 1; when p=0, x=1 otherwise "x" is always equal to 0.

11. (Currently amended) ~~Process according to~~ The process of claim 8, wherein the **[[chain]]** metallocene catalyst ~~component~~ is selected from the group consisting of bis(pentamethylcyclopentadienyl) zirconium dichloride,

bis(pentamethylcyclopentadienyl) hafnium dichloride, bis(tetramethylcyclopentadienyl) zirconium dichloride, (pentamethylcyclopentadienyl) zirconium trichloride, (tetramethylcyclopentadienyl)(t-butylamido)(dimethylsilane) titanium dimethyl, and (pentamethylcyclopentadienyl)(cyclopentadienyl) zirconium dichloride.

12. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the chain growth catalyst system comprises a complex of the Formula (I):

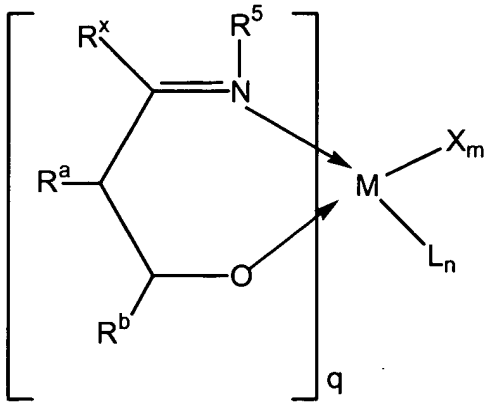


Formula (I)

wherein M is Y[II], Y[III], Sc[II], Sc[III], Ti[II], Ti[III], Ti[IV], Zr[II], Zr[III], Zr[IV], Hf[II], Hf[III], Hf[IV], V[II], V[III], V[IV], Nb[II], Nb[III], Nb[IV], Nb[V], Ta[II], Ta[III], Ta[IV], Cr[II], Cr[III], Mn[II], Mn[III], Mn[IV], Fe[II], Fe[III], Ru[II], Ru[III], Ru[IV], Co[II], Co[III], Rh[II], Rh[III], Ni[II], Pd[II], X represents an atom or group covalently or ionically bonded to the transition metal M; Y^1 is C or $P(R^c)$; Y^2 is $-O(R^7)$, -O (in which case the bond from O to M is covalent), $-C(R^b)=O$, $-C(R^b)=N(R^7)$, $-P(R^b)(R^d)\equiv N(R^7)$ or $-P(R^b)(R^d)=O$; R^a, R^b, R^c, R^d, R^5 and R^7 are each independently selected from the group consisting of hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl, substituted heterohydrocarbyl **[[or]]** and SiR'_3 where each R′ is independently selected from the group consisting of hydrogen, halogen, a hydrocarbyl group, a substituted hydrocarbyl

group, a heterohydrocarbyl group and a substituted heterohydrocarbyl group, and **[[any]]** adjacent ones of R^a, R^b, R^c, R^d, R^5 and R^7 may be joined together to form a ring; G is ~~either~~ a direct bond between Y^1 and Y^2, ~~or is a bridging group, which optionally contains a third atom linked to M when q is 1~~; L is a group datively bound to M; n is from 0 to 5; m is 1 to 3 and q is 1 or 2.

13. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the chain growth catalyst system comprises a complex of the formula (II):

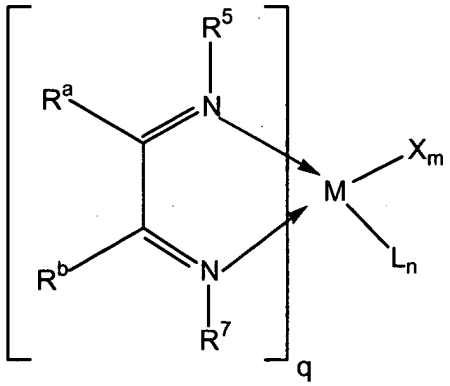


Formula (II)

wherein M is Y[II], Y[III], Sc[II], Sc[III], Ti[II], Ti[III], Ti[IV], Zr[II], Zr[III], Zr[IV], Hf[II], Hf[III], Hf[IV], V[II], V[III], V[IV], Nb[II], Nb[III], Nb[IV], Nb[V], Ta[II], Ta[III], Ta[IV], Cr[II], Cr[III], Mn[II], Mn[III], Mn[IV], Fe[II], Fe[III], Ru[II], Ru[III], Ru[IV], Co[II], Co[III], Rh[II], Rh[III], Ni[II], Pd[II], X represents an atom or group covalently or ionically bonded to the transition metal M; R^a, R^b, R^x, and R^5 are each independently selected from the group consisting of hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl, substituted heterohydrocarbyl **[[or]]** and SiR'_3 where each R′ is independently selected from the group consisting of hydrogen, halogen, a hydrocarbyl group, a substituted hydrocarbyl group, a heterohydrocarbyl group and a substituted

heterohydrocarbyl group, and **[[any]]** adjacent ones of R^a, R^b, R^x, and R^5 may be joined together to form a ring; L is a group datively bound to M; n is from 0 to 5; m is 1 to 3 and q is 1 or 2.

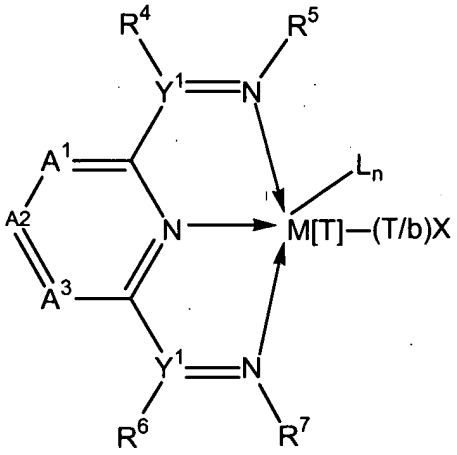
14. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the chain growth catalyst system comprises a complex of the Formula (III):



Formula (III)

wherein M is Cr[II], Cr[III], Mn[II], Mn[III], Mn[IV], Fe[II], Fe[III], Ru[II], Ru[III], Ru[IV], Co[II], Co[III], Rh[II], Rh[III], Ni[II], Pd[II], Cu[I], Cu[II]; X represents an atom or group covalently or ionically bonded to the transition metal M; R^a, R^b, R^5 and R^7 are each independently selected from the group consisting of hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl, substituted heterohydrocarbyl **[[or]]** and SiR'_3 where each R′ is independently selected from the group consisting of hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl and substituted heterohydrocarbyl, and R^a and R^b may be joined together to form a ring; ~~R^5 and R^7 are each as defined above;~~ and L is a group datively bound to M; n is from 0 to 5; m is 1 to 3 and q is 1 or 2.

15. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the chain growth catalyst system comprises a complex of the Formula (IV):

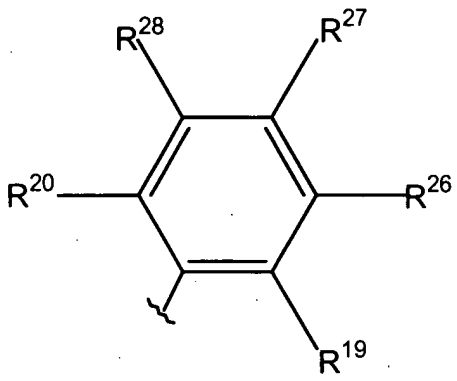


Formula (IV)

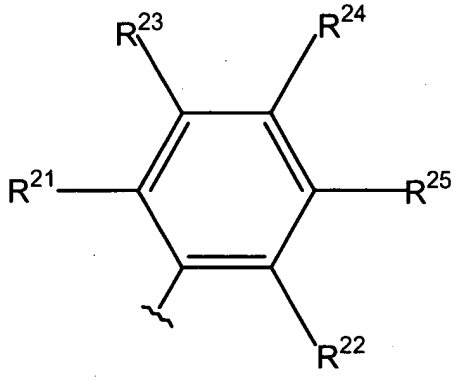
wherein M[T] is Ti[II], Ti[III], Ti[IV], Zr[II], Zr[III], Zr[IV], Hf[II], Hf[III], Hf[IV], V[II], V[III], V[IV], Nb[II], Nb[III], Nb[IV], Nb[V], Ta[II], Ta[III], Ta[IV], Cr[II], Cr[III], Mn[II], Mn[III], Mn[IV], Fe[II], Fe[III], Ru[II], Ru[III], Ru[IV], Co[II], Co[III], Rh[II], Rh[III], Ni[II], Pd[II]; X represents an atom or group covalently or ionically bonded to the transition metal M; T is the oxidation state of the transition metal M and b is the valency of the atom or group X; Y^1 is C or $P(R^c)$, A^1 to A^3 are each independently N or P or CR, with the proviso that at least one is CR; and R, R^c, R^4, R^5, R^6 and R^7 are each independently selected from the group consisting of hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl, substituted heterohydrocarbyl **[[or]]** and SiR'_3 where each R′ is independently selected from the group consisting of hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl and substituted heterohydrocarbyl.

16. (Currently amended) ~~Process according to~~ The process of claim 15, wherein Y^1 is C, and A^1 to A^3 are each ~~independently~~ CR, or A^1 and A^3 are both N and A^2 is CR, or one of A^1 to A^3 is N and the others are ~~independently~~ CR.

17. (Currently amended) ~~Process according to~~ The process of claim 15, wherein Y^1 is C, A^1 to A^3 are each ~~independently~~ CR, and R^5 is represented by the group "P" and R^7 is represented by the group "Q" as follows:



Group P



Group Q

wherein R^{19} to R^{28} are independently selected from the group consisting of hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl **[[**or**]]** and substituted heterohydrocarbyl; and when any two or more of **[[**R^1 to**]]** R^4, R^6 and R^{19} to R^{28} are hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl, said two or more can be linked to form one or more cyclic substituents.

18. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the chain growth catalyst system is ~~selected from~~ 2,6-diacetylpyridinebis(2,4,6 trimethyl anil)$FeCl_2$ **[[**and**]]** or 2,6-diacetylpyridinebis(2, 6 diisopropyl anil)$FeCl_2$.

19. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the activator for the chain growth catalyst system is selected from organoaluminium compounds and hydrocarbylboron compounds.

20. (Currently amended) ~~Process according to~~ The process of claim 1, ~~wherein the chain growth reaction utilises~~ including a neat zinc alkyl medium or a hydrocarbon solvent diluent.

21. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the mole ratio of transition metal complex to zinc alkyl compound is between 1 x 10^{-7} and 1 x 10^{-1}.

22. (Currently amended) ~~Process according to~~ The process of claim 1, wherein the catalyst system is activated by incubation in an aluminoxane solution for about 5 minutes at 20°C prior to addition **[[**to**]]** of the zinc alkyl compound.

23. (Currently amended) ~~Composition~~ A composition comprising an alkyl zinc complex wherein the alkyl groups follow a ~~substantially Poisson-like~~ Poisson statistical distribution of chain lengths up to about 200 carbon atoms, or a ~~substantially Schulz-Flory-like~~ Schulz-Flory statistical distribution of chain lengths up to about 50,000 carbon atoms.